# KAMARAJ COLLEGE (Autonomous)

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(Affiliated to Manonmaniam Sundaranar University, Tirunelveli)

THOOTHUKUDI – 628 003

**(6 Pages)** **Reg. No: ……**

**Question Code No :** 25O00811 **Course Code : 24PSMA32**

**PG Degree - End Semester Examinations, November 2025**

**Third Semester**

**M.Sc. MATHEMATICS**

**R-Programming**

**(For those who joined in July 2024 onwards)**

**Time : 3Hours** **Maximum : 75 Marks**

**PART – A (10 × 1 = 10 Marks)**

**Answer ALL Questions**

**Choose the correct answer:**

1. Which of the following commands is used to create a vector in R?

   (a) vector() (b) c()

   (c) list() (d) matrix()

2. Which operator is used for assignment in R?

   (a) = (b) ==

(c) <- (d) =>

3. Which operator is used for logical AND in R?

(a) & (b) |

(c) && (d) !

4. Which of the following is NOT an arithmetic operator in R?

(a) . (b) %/%

(c) ** (d) &

5. Which function is used to create a data frame in R?

(a) data.frame() (b) data()

(c) make.frame() (d) frame.create()

6. What does a factor represent in R?

(a) Numeric data (b) Categorical data

(c) Character strings (d) Logical data

7. Which function is used to install a new package in R?

(a) library("packageName")

(b) install("packageName")

(c) install.packages("packageName")

(d) load.package("packageName")

8. How do you load an installed package in R for use in a session?

(a) require("packageName")

(b) load("packageName")

(c) use("packageName")

(d) library("packageName")

9. Which function in base R is used to create a histogram?

(a) hist() (b) boxplot()

(c) scatter() (d) barplot()

10. Which package is commonly used in R for advanced data visualization with layered graphics?

(a) ggplot2 (b) dplyr

(c) shiny (d) plotly

**PART – B (5 X 5 = 25 Marks)**

**Answer ALL Questions choosing either (a) or (b).**

**Answer should not exceed 250 words.**

11. (a) Explain the steps to install R on a Windows operating system.

**(OR)**

(b) Describe the main panes of the R-Studio interface and their functions.

12. (a) Explain the different arithmetic operators used in R with examples.

**(OR)**

(b) Write a R-code for simple function to add and multiply two natural numbers.

13. (a) Describe sorting numeric, character and factor vectors in R with examples.

**(OR)**

(b) Write an example of an if-else control statement in R.

14. (a) Explain the steps to install a package in R and how to load it for use.

**(OR)**

(b) Write R code to import a data file from your working directory.

15. (a) Describe how to create a scatter plot in R using base graphics.

**(OR)**

(b) Briefly describe the benefits of using ggplot2 for data visualization over base R plotting functions.

## PART – C (5 X 8 = 40 Marks)

**Answer ALL Questions choosing either (a) or (b).**

**Answer should not exceed 600 words.**

16. (a) Illustrate how to create, save and run scripts in the R-Studio source editor with sample code.

**(OR)**

(b) Write an R program that defines three numeric variables, performs arithmetic operations on them and displays the results.

17. (a) Write an R script demonstrating arithmetic operations on numeric vectors. Also write the output.

**(OR)**

(b) Explain how to create numeric, character and logical vectors in R with example code.

18. (a) Write an R program that creates a data frame containing numeric, character and factor variables and demonstrates basic operations on it.

**(OR)**

(b) Explain control flow structures in R with detailed examples on if, if-else, nested if-else and switch statements.

19. (a) Using code how can you detect missing data in a data frame and remove the rows containing those values?

**(OR)**

(b) Write an R script that installs multiple packages, loads them and sets the working directory.

20. (a) Develop an R script to generate bar plots for different categories of books and explain how to add legends and titles.

**(OR)**

(b) Write a detailed R program using ggplot2 to create a scatter plot with customized labels and colours.